

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application No. 10/567,260)

Filed: February 6, 2006)

Applicants: Kraus et al.)

Title: STATISTIC COMB POLYMERS,
METHOD FOR PRODUCING
THE SAME AND THEIR)

Art Unit: 1796)

Examiner: Ling Siu CHOI)

Attorney Docket: 5942/87209)

Customer No.: 22242)

Confirmation No. 3060

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF ALEXANDER KRAUS UNDER 37 C.F.R. § 1.132

I, Alexander Kraus, pursuant to 37 C.F.R. § 1.132, hereby declare and state as follows:

1. I am one of the inventors of the subject matter claimed in U.S. Application Serial No. 10/567,260.
2. I earned my Diplom-Chemiker (B.Sc.(Chem.)) in 1993 from Johannes Gutenberg University, Mainz, Germany. I earned my doctorate in natural sciences in 1998 from Max Planck Institute for Polymer Research, Mainz, Germany.
3. I have worked at BASF Construction Chemicals GmbH and its

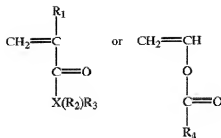
predecessor companies since July of 2000. My work here has focused on the development of new dispersants (superplasticizers) for concrete and other hydraulic binder systems.

4. I was informed by Applicants' attorneys that the Examiner has cited U.S. Patent No. 6,117,921 to Ma as a novelty-defeating reference against the claims of my patent application. I have reviewed the Ma reference. It is apparent that the polymer and its structure described in the reactions of my pending application are inherently different from the dispersant described by Ma. The pending application describes a polymer with alkylene oxide side chains extending from a polymer backbone.

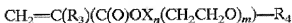
5. The Ma reference does not describe a comb polymer. Instead, as will be described in greater detail herein, Ma makes polymers having a backbone with side chains which also have side chains. Specifically, Ma makes a polymer with acrylic side chains which side chains have ethoxy side chains.

6. Ma's Examples 1 and 2 describe producing a macromonomer by the radical copolymerization of a poly(alkylene oxide) compound (namely ethoxytriethyleneglycol methacrylate) with acrylic acid via a "catalytic chain transfer" (CCT) method. Later using the "macromonomer," Ma says he produces a graft copolymer via a copolymerization reaction with unsaturated monomers via a conventional free radical reaction. A person of ordinary skill in the art of making disperants would readily recognize that this reaction sequence and its chemistry produce a polymer which is significantly different from the polymers produced by the reaction of the pending application.

7. Ma first makes his macromonomer that he calls a "hydrophobic portion" with the monomers described at column 4, lines 50-59. All or nearly all of these monomers are acrylates or acrylics.



8. As a continuation to making his "macromonomer" and to obtain non-ionic hydrophilic portions in his hydrophobic portions, Ma describes incorporating monomers with the general formula:

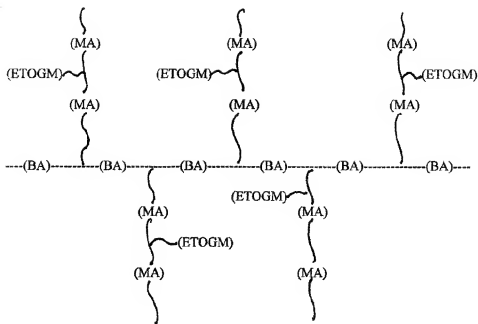


9. The above reactions complete Ma's macromonomer which has side chains having the formula set forth immediately above.

10. Ma states that "[T]he macromonomer is then copolymerized with monomers selected for the backbone via the conventional free radical method," to make the "graft copolymer." (Column 7, lines 9-12.) As a result, Ma's graft copolymer has a backbone (made by chain reacting double bonds) with side chains where the side chains also have side chains that correspond to the general formula:



11. Ma's graft co-polymer with side chains that have side chains is shown below (as would be produced by Ma's Example 3). Ma first made his macromonomer by reacting methacrylic acid (MA) and ethoxytriethyleneglycol methacrylate (ETOGM) as described in his Example 1. Then, as described in Example 3, he took his macromonomer from Example 1 and reacted it with benzyl acrylate (BA) to create his graft co-polymer backbone. The backbone with side chains of MA which have side chains of ETOGM is shown below.

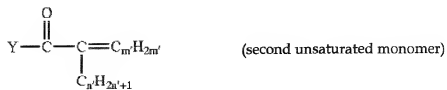
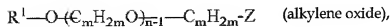


MA is methacrylic acid

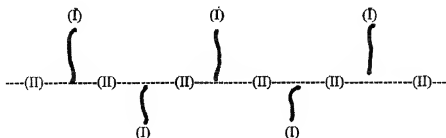
ETOGM is ethoxytriethyleneglycol methacrylate

BA is benzyl acrylate

12. In contrast, this application (SN 10/567,260) describes reacting the double bond end of a vinyl alkylene oxide monomer set forth below with unsaturated co-monomers also set forth below.



13. The Z group has a double bond which would react with the double bond of the second co-monomer. The reaction chemistry of our pending application provides a comb polymer which would look like the illustration set forth below. The alkylene oxide produces the "teeth" of the comb.



I is a side chain that has the alkylene oxide

II is a backbone from the unsaturated monomers

14. The structure of Ma shown above for Ma's graft copolymer of Example 3 is consistent with the rest of his examples. In Example 2, Ma makes a macromonomer using 3 portions of reactants/catalysts (instead of 6 portions of reactants/catalysts described in Example 1) and using methacrylic acid monomer and ethoxytriethyleneglycol methacrylate.

15. In Example 4, Ma uses the macromonomer of Example 2 and uses benzyl acrylate (the same monomer used to make the backbone of Example 3) to make his graft co-polymer.

16. Ma's Examples 5 and 6 are basically the same as Example 4, but Ma used 2-phenoxyethyl acrylate as his "backbone monomer" for the graft copolymer.

17. Ma's Example 7 is the same as Example 5, but Ma used 2-phenylethyl

acrylamide to make the backbone for his graft co-polymer. Indeed the presence of the side chains arising from the macromonomer having carboxyl groups from methacrylic acid (MA) used to make the macromonomer is clear because some of the later examples of Ma show these groups being neutralized. (See Ma Example 14.)

18. In contrast, the dispersant described in this application has alkylene oxide side chains, not polar groups which can/are neutralized. The polymers described in this application have comb teeth which have the alkylene oxides extending off the polymer backbone. These comb polymers are the dispersant (not precursors thereof as in Ma) and show surprisingly better results.

19. The CCT polymerized comb polymers in this application is the dispersant. Ma does not use these polymers as a dispersant or suggest that these polymers be a part of a suspension or used as a dispersing agent. Ma uses his graft co-polymer as a dispersant which does not having an alkylene oxide hanging as a side chain directly off of his polymeric backbone. In contrast, the polymers of the pending application have the alkylene oxide hanging off the backbone; hence, an alkylene oxide forms the "comb teeth" in our comb polymers. It is these polymers which are a part of a suspension or which are used to make a suspension. It is my understanding that Ma would not suggest to a person having ordinary skill in making polymeric dispersants use of the polymers described in this application. Indeed, it is my understanding that Ma suggests the opposite to such a person having ordinary skill because Ma took a macromonomer asserted by the Examiner to be a comb polymer and further reacted the macromonomer to obtain a graft copolymer which Ma says is his dispersant. One of ordinary skill in the art of making polymeric dispersants would recognize that if Ma thought he had a dispersant with his macromonomer, Ma would not have further reacted it to obtain a dispersant.

20. The differences between Ma's composition and the statistic comb polymers of the application are not academic to one of ordinary skill in the art. The statistic comb polymers prepared by means of CCT reactions described in this

application show new and unexpected water reduction capacity at identical dosage than corresponding conventional fluidizers based on comb polymers, which are prepared by radical polymerization. For example, following addition of the novel fluidizers, concrete surprisingly shows markedly reduced stickiness and plastic viscosity, which, in particular, strongly enhanced processability of very cement-rich concretes. It is also surprising and remarkable that concretes prepared by using the inventive fluidizers have markedly greater spread compared to those with conventional polycarboxylate ether fluidizers at identical slump. Thus, at the same water/cement ratio, the concretes surprisingly display a greater shear-thinning behavior than conventional concretes but without showing a tendency to segregate (page 7, 2nd paragraph of the present application).

21. To summarize, one of ordinary skill in the art would recognize that Ma does not make a comb polymer and that Ma instead makes polymers having a backbone with side chains which also have side chains. In contrast, the polymer and structure described in the reactions of this application are inherently different from the dispersant described by Ma.

The undersigned, being warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001) and may jeopardize the validity of the application or any patent issuing thereon, hereby declares that the above statements made of my own knowledge are true and that all statements made on information and belief are believed to be true.

Date: April 28th 2010



Alexander Kraus